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China Report

SCIENCE AND TECHNOLOGY

No. 193

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CHINA REPORT

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MEASURES FOR REFORM OF SCIENCE EDUCATION SYSTEM PROPOSED

Beijing RENMIN RIBAO in Chinese 28 Jan 83 p 1

[Article: "Wen Yuankai Proposes Eight Measures for Reform of the Scientific Education System"]

[Text] Last September Wen Yuankai [3306 0337 0418], a 36-year-old assistant professor at the China Scientific and Technical University, proposed eight measures for reform of the system of management of scientific education in order to deal with faults in the system currently in use in advanced schools and research organizations; the suggested measures have been praised by the Central Committee leadership.

(1) Implement the teaching and research section chief responsibility system. Localities which are able to do so should unite party, government and academic organizations on a temporary basis to unify command. (2) The appointment system should be introduced in the personnel system. (3) The teaching and research section chiefs' responsibility and powers should be strengthened. After soliciting the opinions of all concerned, the schools or departments should appoint teaching and research section chiefs who will have the right to reduce staff and transfer persons who are disruptive, incompetent or unwilling to work hard as well as the right to manage funds. Personnel, work and finance management should be combined, and responsibilities, powers and interests should be linked together. (4) Funds should be raised for teaching and research sections. With the precondition that the schools' and departments' assigned tasks must be completed first, they may obtain financial support by teaching short training classes, providing consultations to society and particularly to production departments, and solving technical and other problems. (5) The teaching personnel should be permitted and encouraged to teach additional courses in society and particularly in the production departments, serve as technical advisers, provide technical and academic consultation, solve technical problems, develop new products, and make a variety of contributions to society and obtain additional compensation for it, provided that they accomplish their assigned amount of work. (6) Schools should use opinion surveys to evaluate the quality of teaching personnel and gradually develop a teaching contingent and teaching methods which provide good teaching quality and the best possible teaching results. (7) Scientific research organizations should gradually develop specific characteristics and adapt to the current scientific research organization of the school system and should make themselves able to take on rather large, high-quality tasks for the state and the production departments. (8) Teaching and research section secretaries should be created to handle routine office work.

8480
CSO: 4008/50

CAS SUCCESSFULLY TESTS NATION'S FIRST PROTON LINEAR ACCELERATOR

Beijing XIANDAIHUA [MODERNIZATION] in Chinese Vol 5 No 2, 25 Feb 83, inside front cover

[Text] According to a XINHUA release, the High-Energy Physics Institute of the Chinese Academy of Sciences has successfully produced the nation's first domestically designed and trial-produced proton linear accelerator. On 17 December 1982, the first 10 million electron volt proton beam was produced.

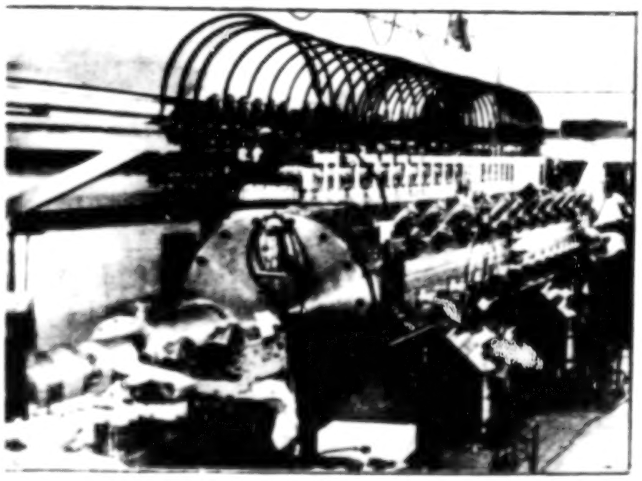

Figure 1. The accelerator cavity, the heart of the proton linear accelerator system, accelerates protons to 10 million electron volts.

Figure 2. Scientists, technicians, and workers assembling the accelerator cavity system.

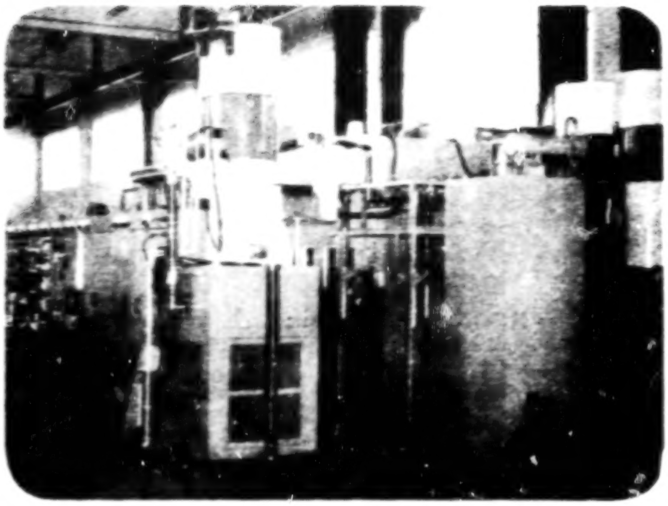

Figure 3. The 200 MHz and 5 MHz high-frequency transmitters which accelerate the protons.

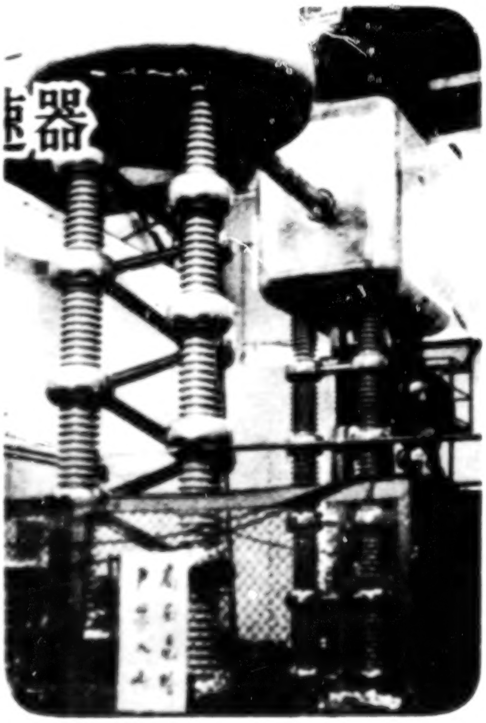

Figure 4. The preinjector. Its role is to accelerate the free protons produced to 750,000 electron volts.

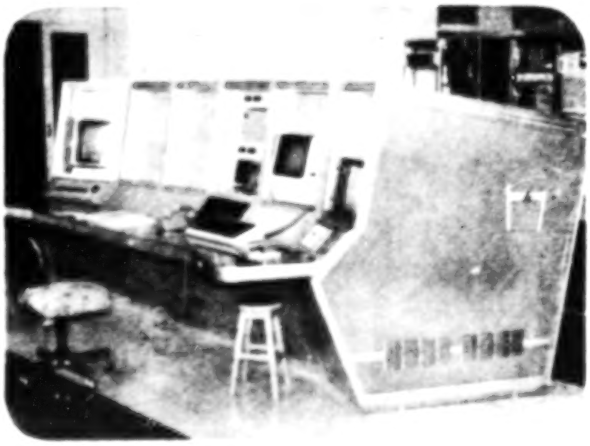

Figure 5. The accelerator's central control console. By means of computers and an interface system, it controls and monitors the accelerator.

CSO: 4008/63

BRIEFS

ZHEJIANG TECHNICAL CONSULTATION CORPORATION—Recently the Zhejiang Provincial Petrochemical Science and Technology Consultation and Development Corporation began operations as the first technical consultation firm in a specialized field in the province. Its services include exchange of technical know-how, assistance in developing new products, popularization of new technologies, supply of technical information and the running of training classes in various specialties. [Text] [Hangzhou Zhejiang Provincial Service in Mandarin 1030 GMT 21 Feb 83 OW]

SHANXI TECHNICAL TRANSFORMATION—According to preliminary statistics, in 1982, Shanxi Province embarked on 2,676 technical transformation projects, 757 projects more than in the preceding year. The amount of investment in technical transformation reached 660 million. Some 60 percent of this amount was spent on energy resources, communications, posts, telecommunications, light industry and textile industry. Of this amount, 78.1 percent was raised by enterprises themselves. In 1982, some 1,300 technical transformation projects were completed, resulting in increasing the fixed assets of all departments of the national economy by some 510 million yuan, increasing the province's industrial output value by some 300 million yuan and increasing profits and taxes by about 80 million yuan. With the completion of these projects, iron-smelting capacity will increase by 5,000 tons, output of electrolytic copper by 750 tons, output of coal by 285,000 tons, output of synthetic ammonia by 4,500 tons, output of power transmission wires of less than 110,000-volts capacity by 372 kilometers, output of sugar by 7,320 tons, and output of glassware by 360 tons. In addition, 61 kilometers of roads can be reconstructed. After technical transformation, 11.3 million tons of coal, 30,000 tons of coke and 1 million cubic meters of timber can be saved. [Text] [HK110718 Taiyuan Shanxi Provincial Service in Mandarin 2300 GMT 5 Mar 83]

CSO: 4008/62

BRIEFS

FRG ELECTRON MICROSCOPE PRESENTATION--Beijing, March 3 (XINHUA)--A presentation ceremony of the electron microscope donated by Karl Carstens, president of the Federal Republic of Germany, during his visit to China in October, 1982, was held here today. Installation and adjustment of the instrument, which has a 400,000 magnifying power, has been completed in the Beijing Medical College. At the ceremony Guenther Schoedel, ambassador of the Federal Republic of Germany of China, handed the presentation certificate to Qu Mianyu, president of the Beijing Medical College. Present at the ceremony were Cui Yueli, Chinese minister of public health, and Bai Jiefu, vice-mayor of the Beijing Municipality. [Text] [Beijing XINHUA in English 0749 GMT 3 Mar 83 OW]

PREVENTIVE MEDICINE CENTER--Beijing, 21 Feb (XINHUA)--With the State Council's approval, China is actively preparing to establish a preventive medicine center with seven units of the Chinese Academy of Medical Science serving as the base. Under the direct leadership of the Ministry of Public Health, the center will study the theory and practice of preventive medical techniques and organize medical science research throughout the country. [Beijing XINHUA Domestic Service in Chinese 0018 GMT 21 Feb 83 OW]

SHANGHAI NUCLEIC ACID RESEARCH--After 3 years of hard work, the Shanghai Organic Chemistry Institute of the Chinese Academy of Sciences has succeeded in developing a strain of yeast capable of high yield of nucleic acid. This significant research achievement will help the development of China's nucleic acid industry. [Shanghai City Service in Mandarin 2300 GMT 7 Mar 83 OW]

CSO: 4008/64

AUTHOR: ZHANG Junyuan [1728 3182 3293]
YAO Dianyuan [1202 3013 0337]

ORG: Both of the Beijing Automotive Repair Company Research Group

TITLE: "Improvement of the Carburation and Intake System of the Shanghai Sedan"

SOURCE: Beijing QICHE GONGCHENG [AUTOMOTIVE ENGINEERING] in Chinese No 1, 1983 pp 14-19

TEXT OF ENGLISH ABSTRACT: The carburation and intake system of the Shanghai Sedan has the following shortcomings: Due to manufacturing tolerance, adjustment of the compatibility of two carburetors used is almost impossible and early failure of the intake preheating thermostat leads to intake overheating. The authors have tested a two-barrel differential action carburetor with revised intake preheating system and an enlarged manifold. While the acceleration remains unchanged, the service fuel consumption drops nearly 10 percent.

Several hundred Shanghai Sedans have been modified in this way. All show good results.

AUTHOR: WU Qingshi [0702 1987 2514]

ORG: Shiyan Automotive Plant No 2

TITLE: "Equipping a Modern Automobile Manufacturing Plant Using Self-reliance"

SOURCE: Beijing QICHE GONGCHENG [AUTOMOTIVE ENGINEERING] in Chinese No 1, 1983 pp 37-43

TEXT OF ENGLISH ABSTRACT: The author summarizes the experience of establishing the second automobile plant. Differing from the first automobile plant which imported from abroad products, equipment and tools and dies, the product of the second automobile plant was designed by us and is equipped mainly with domestic machinery.

The author is of the opinion that we should not import a whole plant, but should further develop our auto industry. To shorten the time needed, we can import product design and some precision machinery so that we can develop our own techniques and save foreign currency.

9717
CSO: 4009/112

AUTHOR: ZHENG Wenyi [6774 2429 0308]

ORG: None

TITLE: "Fluorescent Magnetic Powder Wound Detection Experience Exchange Conference"

SOURCE: Shanghai WUSUN JIANCE [NONDESTRUCTIVE TESTING] in Chinese No 1, Feb 83 p 3

ABSTRACT: The Nondestructive Testing Society China Society of Mechanical Engineering called a Fluorescent magnetic powder wound detection experience exchange conference in Yixing of Jiangsu Province in the middle of Oct. Delegates representing a dozen or so units of machine industry, aviation, shipbuilding, weapons, railway, metallurgy, petroleum, chemistry, electric power, air force, and Chinese Academy of Sciences attended this small special subject conference. Fluorescent magnet powder has been common in foreign countries. In China several types have been on the market in recent years and the quality of the products has been improving but their application has not be extensive. Changcheng Steel Mill introduced its experience of using the powder since Oct 79; to date nearly 1,500,000 tons of steel materials have been tested with this powder. Xindu Machine Plant, Hongan Company, and Changchun Automobile Plant No 1, etc. discussed the comparative properties of several types of fluorescent magnetic powder and brought up the problem of washing and rust prevention after magnetic suspension water is used on parts. Shanghai Aviation Electrical Instrument Plant brought up the problem of protective ultraviolet ray filtering glasses. In order to extend the use of the powder, aside from the dry powder, magnetic ointment, liquid concentrate, spray can, etc. should be made for the convenience of the users and such accessories as ultraviolet lamp, ultraviolet intensity meter, dispersing agent, etc. should also be made available at the same time.

AUTHOR: LIN Hongchu [2651 3163 0443]

ORG: Science Committee of Yixing County

TITLE: "YC-2 Type Fluorescent Magnetic Powder Certification Conference Held in Yixing"

SOURCE: Shanghai WUSUN JIANCE [NONDESTRUCTIVE TESTING] in Chinese No 1, Feb 83 p 36

ABSTRACT: On 17-19 82, the Yixing County Science and Technology Committee called a conference in Yixing to certify the product, YC-2 Type fluorescent magnetic powder. It was attended by 88 delegates representing 70 related units. The Research Institute of Aviation Materials Ministry of Aviation Industry, the Bridge Wound Detection Material Plant, the Academy No 5 of Ministry of Machines, Beijing Diesel Engine Plant, Shanghai Laser Institute, Maanshan Steel and Iron Company, and Shanghai Steam Turbine Plant reported on trial application of the product. A certification Team of 13 persons representing Beijing Diesel Engine Plant, East Shanghai Shipbuilding Plant, etc. reported on the tests and examination work performed by the team. The delegates agreed that the powder, in either water or oil suspension, can meet the needs of inspecting various ferromagnetic parts or large structural members, with a sensitivity close to the indices of similar products made in foreign countries. This product was approved for production in batches.

6248
CSO: 4009/117

AUTHOR: LI Ailin [2621 5932 2651]
ZHAO Jingliang [0719 2529 5328]
LI Jiaju [2621 1367 7467]

ORG: LI Ailin of the Institute of Geochemistry, Chinese Academy of Sciences; ZHAO and LI Jiaju both of the Institute of Geology, Chinese Academy of Sciences

TITLE: "Xitieshanite--A New Ferric Sulfate Mineral"

SOURCE: Guiyang KUANGWU XUEBAO [ACTA MINERALOGICA SINICA] in Chinese No 4, 1982 pp 241-247

EXCERPTS FROM ENGLISH ABSTRACT: Xitieshanite is a new mineral discovered in the middle to lower part of the oxidation zone of a lead-zinc deposit at Xitieshan, Qinghai Province. The associated minerals are copiapite, roemerite, coquimbite, amarillite, sideronatrite and melanterite.

The mineral is rhombic rectangular. It is bright green with a light yellow tint, translucent to almost transparent. The chemical formula is $FE^{3+}SO_4OH\cdot7H_2O$. The DTA curve has three strong endothermic peaks at 85, 170 and 735°C, and a weak peak at 490°C. TGA analysis shows that the weight loss takes place in three different steps. IR absorption curve includes two principal absorption zones at 3350 and 1220-1000 cm^{-1} and two subordinate zones at 1620 and 602 cm^{-1}.

The mineral is named after the Xitieshan mine where it was discovered.

AUTHOR: WEI Mingxiu [7614 2494 4423]
WANG Fengge [3769 7685 7041]
YIN Chengyu [3009 2052 3768]

ORG: WEI and WANG both of the Institute of Geology, Ministry of Metallurgical Industry; YIN of the Geological Team No 308, Yunnan Geological Exploration Corporation, Ministry of Metallurgical Industry

TITLE: "Nordenskiöldine Discovered in China and Its Formation Conditions"

SOURCE: Guiyang KUANGWU XUEBAO [ACTA MINERALOGICA SINICA] in Chinese No 4, 1982 pp 262-266

TEXT OF ENGLISH ABSTRACT: Nordenskiöldine discovered in China occurs in a normal contact zone containing skarns where the replacement of boron and fluorine is well developed. It occurs as hexagonal tabular crystals, is colorless and transparent, has conchoidal fracture and glassy luster and is brittle. VHN_{100} = 258.8 kg/mm^2 and specific gravity is 4.15. Under cathode rays it emits light blue fluorescence. It is optically uniaxial, negative. No is slightly less than 1.78 and Ne = 1.670. Its main components include SnO_2 53.58, CaO 19.75 and B_2O_3 25.27 percent. The It has the formula of $(Ca_{0.979}Mg_{0.019}Fe^{2+}_{0.005}Mn^{2+}_{0.002})_{1.005}Sn_{0.993}(B_{1.010}O_3)_2$. The mineral is of the hexagonal system. Unit cell parameters are: a_0 = 4.8597(8), c_0 = 16.003(5)Å. Possible space group: C^2_{3i} = $R\bar{3}$(?)(147). X-ray powder data are given.

[Continuation of KUANGWU XUEBAO No 4, 1982 pp 262-266]

Associated minerals include andradite, magnetite and fluorite. During the pneumatohydrothermal stage Sn-bearing minerals were replaced by boron under oxygen-high, sulfur-low and boron-rich conditions, forming nordenskiöldine. The formation temperature was estimated to be 400-500°C. Later in a low-temperature hydrothermal solution (about 150°C), nordenskiöldine was replaced by fluorine and was consequently altered into varlamoffite and Sn-brucite.

9717
CSO: 4009/109

Optics

AUTHOR: PAN Anpei [3382 k344 k014]
TANG Xingli [3282 2502 6849]

ORG: Both of the Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences

TITLE: "Theoretical and Experimental Investigation of Pulse Compression in Flashlamp Pumped Dye Laser (FLPL)"

SOURCE: Shanghai GUANGXUE XUEBAO [ACTA OPTICA SINICA] in Chinese No 1, 1983 pp 22-28

TEXT OF ENGLISH ABSTRACT: Numerical solutions of the rate equations for pulsed reflected mode (PRM), pulsed transmission mode (PTM) and normal operation have been performed by computer in terms of FLPL operating parameters. The results are analyzed and compared. Some primary factors affecting photon density in the cavity for PTM operation are investigated. The principal results of theoretical investigation have been confirmed by experiments. The pulse duration compression from μs to 3 ns has been obtained. The peak power was raised from decades kW to MW by PTM operation.

AUTHOR: WANG Zhicheng [3076 1807 6134]
CAO Ling [2580 3781]

ORG: Both of the Department of Physics, University of Lanzhou

TITLE: "A Semiclassical Theory of a Two-photon Laser"

SOURCE: Shanghai GUANGXUE XUEBAO [ACTA OPTICA SINICA] in Chinese No 1, 1983 pp 35-40

TEXT OF ENGLISH ABSTRACT: The semiclassical Lamb method is applied to the problem of a single mode two-photon laser (TPL). The steady-state solutions of the amplitude equation are obtained, and their stability properties are analyzed. It is found that for TPL there exist threshold requirements both for pumping and for the light field intensity. The frequency equation predicts a mode-pulling effect.

AUTHOR: ZHAO Jingman [6392 4544 3341]

ORG: None

TITLE: "Huangshan Optical Thin Film Conference"

SOURCE: Shanghai GUANGXUE XUEBAO [ACTA OPTICA SINICA] in Chinese No 1, 1983 p 60

ABSTRACT: A total of 76 representatives from institutes of higher learning, research units, factories and enterprises throughout China attended the conference from 31 August to 6 September, including such special guests as Associate Professor Wang Xun [3769 6598] from Fudan University whose topic was "Surface Physics, Surface Analysis Techniques and Their Relationship to Optical Thin Films," Associate Professor Jia Yurun [0328 3768 3387] on "Measurement of Thin Film Optical Qualities," and Associate Professor Han Liying [7281 7787 5391] of Qinghua University on "Optical Parameters in Thin Film Laser Interferometry." The conference was organized around special topics, with discussion focusing on monitoring and measuring aspects, including: wide spectrum scanning; quartz oscillation monitoring; elliptical polarization tests n, k, d; diffraction, absorption and low radiation tests; and routine measurement, etc.

9717
CSO: 4009/104

Power Engineering

AUTHOR: NIU Tiankuang [3662 1131 0400]

ORG: Shanghai Boiler Plant

TITLE: "Current Condition and Development of Large Power Station Boilers in China"

SOURCE: Shanghai DONGLI GONGCHENG [POWER ENGINEERING] in Chinese No 1, 15 Feb 83 p 54

ABSTRACT: In the 60's, China began to design and manufacture DC boilers and the 1st became operative in 1968. There are 5 of them in this early group, generating 475Mw of power. These were followed by a group of 7 300 Mw subcritical pressure DC boilers. One of these has been in service for 8 years. There were frequent accidents with these and the condition has been improved somewhat. Shanghai Boiler Plant is currently designing 2nd generation single chamber 300 Mw UP type DC boilers in anticipation of improving the properties. In terms of parameter development, supercritical pressure is the necessary direction. On the bases of the single chamber 300Mw DC boiler and capacity development, the development of 600 Mw UP type DC boilers may be considered.

The Direction Of Future

AUTHOR: SHI Qiangsun [2457 1730 1327]

ORG: Shanghai Research Institute of Industrial Boilers

TITLE: "Development of Industrial Boilers in Recent Years and the Direct of Future Efforts in China"

SOURCE: Shanghai DONGLI GONGCHENG [POWER ENGINEERING] in Chinese No 1, 15 Feb 83 p 57

ABSTRACT: In the late 60's, the emphasis began to turn to the direction of designing her own industrial boilers in China. Those designed in the 50's and 60's were mainly for superior quality bituminous coal and the development of experimental designing of boilers for poor quality coal began in the middle 70's. After 1980, the work of experimenting with designing boilers for medium quality coal was launched. At present, China can produce complete lines of industrial boilers for all types of coal, oil, and gas. From manufacturing, installation, to testing, a whole set of systems of basic standards has also been established. This paper is an excerpt of a paper introducing the experimental work on burn devices, automatic control instruments, water treatment equipment, etc. in its first part. In its 2nd part, the direction of future development, essentially the development of 4 ton/hour capacity, high efficiency, quick water recovery boilers, is discussed, as well as the necessity of adopting international standards and pursuing economic benefits. The excerpt provides no further details of the paper, which was among the ones delievered before the [illegible] Conference of the Power Engineering Society China Society of Mechanical Engineering.

6248
CSO: 4009/113

AUTHOR: ZHANG Jinxue [1728 6651 1331]

ORG: Chinese Research Institute of Printing Technology

TITLE: "Pay Close Attention to the Development Trend of Printing Technology to Promote Technological Reform"

SOURCE: Beijing YINSHUA JISHU [PRINTING TECHNOLOGY] in Chinese No 2, Feb 83 pp 5-9

ABSTRACT: In a speech to the National Printing Industry Science and Technology Information Network Liaison Personnel Training Class, the author reviewed briefly the condition of the printing industry in China. Since the liberation, the number of annual publications has increased 27-fold. More than 10,000 printing plants are now distributed all over the country and the number of printers is about 10 times that of 1949. China can now manufacture large printing, plate-making, and binding machines and some of these are being exported. Such materials as paper and printer's ink can basically satisfy domestic needs. Research institutes of printing technology are established in many provinces, cities, and autonomous regions to create the condition for technical reform. Due to a decade of disturbance, China is still behind industrially developed countries of the world, however. The major problems are excessively long printing cycles and generally poor quality aside from a few key journals and pictorials. These problems, the author believes, are mainly caused by the level of technology and management. In this paper, various aspects of technological reform needed in China's printing industry are discussed.

6248
CSO: 4009/115

AUTHOR: None

ORG: None

TITLE: "The 2nd Sino-French Scientific Instrumentation Symposium Held in France"

SOURCE: Beijing YIQI YIBIAO XUEBAO [CHINESE JOURNAL OF SCIENTIFIC INSTRUMENT] in Chinese No 1, Feb 83 p 112

ABSTRACT: The 2nd Sino-French Scientific Instrumentation Symposium was held on 14-16 Sep 82 in the summer school of physics of Grenoble University of France. The Chinese delegation was headed by WENG Dimin [5040 6611 3046] a member of the Standing Committee of China Society of Instruments and Meters and the French delegation was headed by the president of Grenoble University. The discussion proceeded under the 3 special headings of applied optics, superconduction and nuclear magnetic resonance, and electron microscopy; a total of 24 papers, 9 Chinese and 15 French, were delivered. Following the first symposium held in Hangzhou, China in Sep 80, this 2nd symposium further strengthened the link and friendship among French and Chinese specialists of the field. It was resolved that the 3rd symposium will be held in China in 1985.

6248
CSO: 4009/116

AUTHOR: FANG Liangwei [2455 5328 0251]
CHEN Xiao [7115 2556]

ORG: Both of the Nanjing Aeronautical Institute

TITLE: "An Experimental Study of High Subsonic Two-dimensional Diffuser Designed by dM/dx = Constant"

SOURCE: Beijing GONGCHENG REWULI XUEBAO [JOURNAL OF ENGINEERING THERMOPHYSICS] in Chinese No 1, 1983 pp 7-14

TEXT OF ENGLISH ABSTRACT: The performance data and flow characteristics for two-dimensional single-plane diffuser designed by dM/dx = constant have been studied experimentally at high subsonic speeds in a small diffuser tunnel. The tests were carried out at M_1 (diffuser entrance Mach number) $\approx 0.2-0.8$, corresponding to a Reynolds number range of $2.08 \times 10^5 - 8.32 \times 10^5$. Both time-mean flow properties and fluctuating flow properties have been measured.

The test results show that the value of steady-state performance is affected to a great extent by inlet conditions and geometry parameters of diffusers. The maximum total pressure fluctuation occurring in the turbulent shear layer and the location of the $(y/\delta)_{\Delta P_{RMS}.\max}$ value is nearly equal to 0.6-0.75.

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CSO: 4009/110

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April 15, 1983